lected by Mr. Wilson from several large trees, among which I find only a single leaf with one lateral lobe, the leaves of older trees are almost invariably entire, but they are partly three-lobed on his specimens of young plants. The only fruit collected is smaller than that of the Chinese species and measures 6 mm. in diameter.

The Formosan species occurs only in scattered individuals on the mountains Arisan and Randaisan and possibly elsewhere on the island, while each of the other two species has a much wider distribution and is much more common within its range. All the species, however, are only relics as compared with the range of the genus during the Tertiary period, when it was distributed apparently all over the northern hemisphere.

NOTES ON NORTH AMERICAN TREES. VI[1]

C. S. SARGENT

Hamamelis

THE different species of Hamamelis cannot be distinguished by good morphological characters, the structure of the flowers, fruits and seeds being the same in them all, and in view of the superficial botanical surveys on which the earlier publications on the plants of the southern states were based it is not surprising that all the Witch Hazels in North America have usually been referred to a single species, *Hamamelis virginiana* L. Walter, however, in 1788 mentioned without descriptions three species, *dioica*, *monoica* and *androgyna*, and in 1814 Pursh described his *H. macrophylla* based on a specimen collected by Lyon on river banks in the western part of Georgia and chiefly distinguished by the tubercles on the lower surface of the leaves. After Nuttall in 1818 and Elliott in 1821 no American author has considered Pursh's plant which has been referred without comment to *H. virginiana*. In 1911 I described as *H. vernalis* a small winter-flowering shrub spreading into thickets by stolons and common on the gravelly banks of streams in southern Missouri and now known to extend through Arkansas into eastern Oklahoma and distinguished from *H. virginiana* by the red color of the inner surface of the calyx-lobes and by the shape of the leaves which are often round at apex, more symmetrical at base, less coarsely lobulate and pale and often glaucous below. At one time I believed that the Witch Hazel of Louisiana could be referred to this species, but the leaves of all the specimens of Hamamelis which I have seen from the Gulf States are covered with tubercles. These are the enlarged bases of the short stellate hairs which cover the young leaves and are more prominent on the lower than on the upper surface. Such tubercles are not common in Hamamelis, and have not been found on the leaves of any other species except occasionally on one of the Japanese species. These tubercles, the smaller flowers which open from December to February with a calyx only 5 mm. across the flattened lobes and pale yellow sometimes streaked with red, petals only 8 mm.

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[1] For part. V, see p. 61.

long and less than 1 mm. wide, and the shape of the leaves which are often rounded at apex and more symmetrical at base seem to distinguish sufficiently the southern plant from *H. virginiana*. From *H. vernalis* it differs in the yellow color of the inner surface of the calyx, and in the tubercles on the leaves which are green and not pale or glaucous below, and I am inclined to consider the plant of the Gulf States a species and to take up for it Pursh's name although it is an unfortunate one for the leaves are usually smaller than those of *H. virginiana* and they are rarely if ever "suborbicular."

Hamamelis macrophylla Pursh, Fl. Am. Sept. I. 116, 1814. — Elliott, Sketch, I. 220 (1821). — *Hamamelis virginiana β. macrophylla* Nuttall, Gen. I. 107, 1818. — *Hamamelis virginiana* of many authors, not L.

Leaves oblong-obovate or occasionally broad-elliptic, rounded, acute or rarely acuminate at apex, cuneate, rounded or cordate at the narrow slightly unsymmetrical base, crenately lobulate above the middle with small rounded lobes, covered when they unfold with short stellate hairs more abundant on the lower than on the upper surface, at maturity dark green above, lighter green below, and roughened by the persistent tubercle-like bases of the stellate hairs, 8–13 cm. long, and 5–8 cm. wide, with a slender midrib and five or six pairs of primary veins; petioles slender, pubescent, 1.5–2 cm. in length. Flowers opening in December, January and February; calyx yellow often slightly streaked with red on the inner surface. Fruit ripening in the autumn, about 1.2 cm. long; seeds acute, dark chestnut-brown or nearly black.

A tree often 10–15 m. high, producing stoloniferous shoots round the tall trunk up to 15 cm. in diameter, spreading branches, and branchlets rusty tomentose during their first year, becoming glabrous or nearly glabrous in their second season.

All the specimens of Hamamelis from the Gulf States which I have seen have the tuberculate leaves of *H. macrophylla* which extends northward to the neighborhood of Savannah, Georgia, and to southern Arkansas. The following specimens are in the herbarium of the Arboretum and in the Gray Herbarium (H. G.):

GEORGIA. Chatham County, near Savannah, *C. E. A. Hale*, July, 1911, January and February, 1912; Lowndes County, near Valdosta, *J. K. Small*, June 6–12, 1895.

FLORIDA. Duval County, Jacksonville, *T. G. Harbison*, December 3, 1917, Clay County, *John Donnell Smith*, March 27, 1886 (No. 26) (H. G.); Columbia County, Lake City, *F. E. Straub*, December, 1814 (No. 34) (H. G.); Gadsden County, River Junction, *G. V. Nash*, August 10, 1895 (No. 2385).

ALABAMA. Mobile County, Mobile, *Gates, Fletcher and Jewett*, April, 1839 (No. 82) (H. G.); Dallas County, banks of the Alabama River near Berlin, *R. S. Cocks*, December, 1919.

MISSISSIPPI. Wayne County, Waynesboro, *C. L. Pollard*, August, 1896 (No. 1238) (H. G.); Jackson County, Ocean Springs, *J. Skehan*, September 15, 1895; Harrison County, Biloxi, *S. M. Tracey*, January 8, 1894 (No. 2842); Hinds County, near Jackson, *T. G. Harbison*, May 15 and 20, 1915; Adams County, near Natchez, *C. C. Compton*, December, 1919.

LOUISIANA. New Orleans, *Thomas Drummond*, 1832 (No. 137) (H. G.); St. Tammany Parish, Covington, *C. S. Sargent*, April 1, 1900, *R. S. Cocks*, April 14 and 20, 1910; West Feliciana Parish, near Bayou Sara, *C. S. Sargent*, April 12, 1916; Catahoula Parish, Urania, *E. J. Palmer*, May 12, 1915 (No. 7586); Lincoln Parish, Ruston, *R. S. Cocks*, July, 1909 and February 4, 1911; Richland Parish, Alto, *R. S. Cocks*, April 18, 1910; Winn Parish, Winnfield, *C. S. Sargent*, April 6 and November 9, 1913; St. Landry Parish, 10 miles west of Opelousas, *C. S. Sargent*, April 4, 1913; Natchitoches Parish, Natchitoches and Chopin, *E. J. Palmer*, April 16 and March 22, 1915 (Nos. 7246 and 7065); Calcasieu Parish, Lake Charles, *C. S. Sargent*, March 25, 1911, *R. S. Cocks*, March 27, 1911.

TEXAS. Jefferson County, Beaumont, *E. J. Palmer*, September 12, 1917 (No. 12728); Fletcher, Hardin County, *E. J. Palmer*, April 25, 1917 (No. 9558).

ARKANSAS. Hempstead County, McNab, *E. J. Palmer*, October 19, 1915 (No. 8972); Saline County, Benton, *E. J. Palmer*, September 2, 1915 (No. 8441).

The most southern stations from which I have seen *Hamamelis virginiana* are in the neighborhood of Stone Mountain, DeKalb County, near Reynolds, Taylor County, and banks of the Savannah River near Augusta, Richmond County, Georgia, and McNab, Hempstead County, southern Arkansas.

Crataegus

CRUS-GALLI

Crataegus montivaga, n. sp.

Leaves obovate to oval, rhombic or suborbicular, rounded, acute or acuminate or abruptly short-pointed at apex, concave-cuneate at base, sharply serrate to below the middle with straight acuminate glandular teeth, dark green, lustrous and scabrate above, pale yellow-green below, 2.5–3 cm. long, 1.8–2.5 cm. wide, with a thin midrib and prominent primary veins; petioles slender, wing-margined at apex, villose early in the spring, becoming glabrous, about 6 mm. in length. Flowers opening late in April 1.2 cm. in diameter, on villose pedicels 6–12 mm. long, in compact mostly 7–10-flowered villose corymbs, their bracts and bractlets linear-obovate, glandular-serrate; calyx-tube broadly obconic, glabrous or with occasional hairs near the base, the lobes gradually narrowed from a wide base, glandular-serrate, sometimes laciniate near the acuminate apex, glabrous on the outer surface, villose on the inner surface; stamens 10–15, usually 10; anthers pink; styles 2 or 3. Fruit ripening late in September or early in October, on erect nearly glabrous or villose pedicels, short-oblong to ellipsoidal, orange-red, about 8 mm. long, the calyx much enlarged; flesh thin, dry and mealy, yellow-green; nutlets 2 or 3, rounded at apex, ridged on the back with a low broad rounded ridge, about 6 mm. long.

A bushy tree rarely more than 4 or 5 m. high, with a short trunk 25–30 cm. in diameter, erect and spreading branches, and slender nearly straight branchlets orange-brown and covered with long scattered pale hairs when they first appear, dull red-brown and glabrous at the end of their first season and gray the following year.

WESTERN TEXAS. Rocky banks of streams: Kendall County, near Boerne, May 15, 1910, *B. Mackensen*, June 21 and September 30, 1913, *G. A. Schattenberg*, April 27, 1914, *G. D. Gray*, May 19, 1916, *E. J. Palmer* (rocky banks of Spring Creek, No. 9820), September 27, 1916, *E. J. Palmer* (No. 108828, type), April 6, 1917, *E. J.*

Palmer (Rocky banks of Cibolo Creek, No. 11476), April 7, 1917 (No. 11487), Lindendale, May 25, 1916, *E. J. Palmer* (along rocky banks of streams, No. 9899); Comal County, Fischer's Store, June 6, 1917 (limestone hills, No. 12197); Bandera County, June 18, 1916, *E. J. Palmer* (rocky banks of Seco Creek, No. 10245); northern Edwards County, October 10, 1916, *E. J. Palmer* (No. 10976); Callahan County, *E. J. Palmer*, May 30, 1918 (sandy uplands, No. 13806); Brown County, Brownwood, October 23, 1916, *E. J. Palmer* (No. 11109); Jeff Davis County, Spraul Ranch near Fort Davis, August 25, 1913, *D. M. Andrews*.

Common on the rocky banks of streams on the Edwards Plateau; and interesting as the extreme southwestern representative of the Crus-galli Group, and its only species in western Texas.

Crataegus Cocksii, n. sp.

Leaves oblong-obovate, acute or rounded at apex, gradually narrowed and cuneate at base, finely serrate above the middle with straight acuminate teeth, glabrous, dark green and lustrous above, dull and paler below, 2.2–3 cm. long, 5–10 mm. wide, with a slender midrib, and slender primary veins mostly within the parenchyma; petioles slender, about 4 mm. in length; leaves at the ends of vigorous shoots broad-obovate, rounded or abruptly short-pointed at apex, thicker, more coarsely serrate, often 4 cm. long and 2.5 cm. wide. Flowers opening early in April, 1.5–1.8 cm. in diameter, on slender pedicels, in compact few-flowered glabrous corymbs; calyx-tube broadly obconic, glabrous, the lobes oblong-ovate, gradually narrowed and acuminate, entire, sparingly villose on the inner surface; stamens 20, small, pale rose color; styles 2 or 3, surrounded at base by clusters of white hairs. Fruit ripening in October, on slender pedicels about 6 mm. long, in few-fruited clusters, short-oblong to slightly obovoid, crimson, lustrous, 8–12 mm. long, with spreading calyx-lobes mostly deciduous from the ripe fruit; flesh yellow, dry and mealy; nutlets 2 or 3, ovoid, acute at apex, rounded at base, prominently ridged on the back, about 6 mm. long.

A slender tree 7 or 8 m. high, with a tall stem 10–15 cm. in diameter, with dark red-brown bark covered with small closely appressed scales, slender pendulous smooth branches and slender bright red-brown glabrous branchlets becoming gray in their second year, and armed with slender dark chestnut-brown lustrous spines 3–4 cm. in length.

LOUISIANA: Winn Parish, low rich woods at the marble quarry near Winnfield, *R. S. Cocks and C. S. Sargent*, April 6 and October 9, 1913.

I am glad to associate with this handsome tree, which differs from other Cock-Spur Thorns in its head of gracefully drooping branches, the name of Reginald Woodhouse Somers Cocks, professor of botany in Tulane University, tireless explorer of the flora of Louisiana.

AESTIVALES

This is one of the most distinct of the groups into which the species of Crataegus can be divided. The species all have large flowers in few-flowered simple corymbs, which open with or before the leaves unfold from February to April; the stamens are normally 20, but flowers with 15 or 25 stamens occasionally occur; the styles vary from 3–5. The fruit ripens in spring or summer and is scarlet, lustrous and short-oblong to subglobose, with thick yellow succulent subacid flesh; the nutlets vary from 3–5 and are small, rounded or slightly ridged and grooved on the back, with a broad prominent hypostyle extending to below the middle of the nutlet. The fruit is largely gathered for jellies and preserves. The species, which are small trees or shrubs, grow in shallow depressions filled with water during most of the year (" pond-holes "). on the wet borders of streams and swamps, and in low wet woods.

The name aestivalis in connection with a Crataegus was first used by Walter in 1788 who published in his Flora Caroliniana "Mespilus aestivalis spinosa, foliis angulatis serratis, floribus corymbosis, baccis magnis rubris." A specimen of this plant unfortunately is not found in Walter's herbarium preserved in the British Museum, and it is impossible to do more than guess at the identity of his plant. Pursh referred it as a synonym to *Crataegus coccinea* L.: Nuttall did not mention it: Elliott doubtfully referred it to *C. elliptica* Pursh, and Elliott's *C. lucida*, which he seems to have considered a Crus-galli species, is also probably Walter's plant. The name *Crataegus aestivalis* was first used by Torrey & Gray, in 1840, but their description is of a plant of southwestern Georgia and western Florida which is not known in the coast region of South Carolina or Georgia, where there is a species of this group which might have been known to Walter as it now grows near Yemassee, South Carolina, and near Valdosta and Meldrim, Georgia, all within the region probably well known to Walter. Walter's description as far as it goes describes this coast plant for the leaves at the ends of vigorous branches are " angulatis serratis " and the fruit is large and red; and it is therefore probably safe to use aestivalis as the specific name for the Atlantic-coast May Haw. If Walter's name is not used Elliott's *C. lucida*, if it were not a synonym, might perhaps be used for this tree, for there is no other Crataegus with " corymbis simplicibus, plaucifloris " now growing where he found his *C. lucida*, "on the margin of the Ogeechee River just where the tides cease to flow." Meldrim is now at this point and May Haws are abundant there. Whether the *C. lucida* of Elliott is our plant or not Elliott certainly knew the May Haw which he believed was probably the *Mespilus aestivalis* Walt., for his description of it under *C. elliptica* Pursh leaves no doubt on this point. I did not know the Atlantic coast species until 1916 when Mr. Harbison obtained abundant material, and in 1906 I described under the name of *C. maloides* a May Haw from the east coast of Florida which varies so little from the Georgia plant that it may be considered a variety; and this is true of two other May Haws also from Volusia County, Florida, *C. cerasoides* and *C. luculenta* which I described in 1913.

The species of this Group may be arranged as follows:

Leaves glabrous with the exception of the small tufts of axillary hairs on their lower surface.

Leaves oblong-obovate, 3–5 cm. long; flowers in 2- or 3-flowered corymbs; stamens 15–20; anthers pale pink; a tree with nearly straight sparingly armed branchlets. *C. aestivalis.*

Leaves broad-obovate, 1–2 cm. long; flowers usually solitary; stamens 20; anthers dark rose color; a shrub rarely 2 m. high, with conspicuously zigzag branchlets covered with spines . . . . *C. monantha.*

Leaves hoary tomentose below early in the season, becoming villose with rufous hairs most abundant on the midrib and veins; stamens 20; anthers deep rose color.

Leaves oblong-obovate, acute or broad and rounded at apex, often slightly lobed above the middle, lustrous above; pedicels villose-pubescent . . . *C. rufula.*

Leaves elliptic to oblong-cuneiform, narrowed at apex, dull above; pedicels glabrous . . . . *C. opaca.*

Crataegus aestivalis Sargent (not Torrey & Gray). — *Mespilus aestivalis* Walter, Fl. Car. 148, 1788. — ? *Crataegus lucida* Elliott, Sketch, I. 548 (1821).

Leaves oblong-obovate, rounded or acute at apex, cuneate at base, coarsely serrate above the middle with glandular teeth, furnished below with small tufts of axillary hairs, otherwise glabrous, dark green and lustrous above, yellow-green below, 3–5 cm. long, 1–2 cm. wide, short-petiolate, at the ends of vigorous shoots often laterally lobed. Flowers 2 cm. in diameter, in 2- or 3-flowered corymbs; calyx-tube narrowly obconic, glabrous, the lobes short, acute, glabrous, eglandular; stamens 15–20; anthers pink or pale rose color; styles usually 3. Fruit on a short erect pedicel, usually solitary, short-oblong, 8–10 mm. long, the calyx persistent with erect lobes.

A tree 7 or 8 m. high, with a tall stem 15–20 cm. in diameter, covered with pale flaky bark, erect or slightly spreading branches, and slender branchlets chestnut-brown and lustrous in their first year, becoming dull gray-brown the following year, and armed with stout spines 1.5–3 cm. in length.

GEORGIA: Effingham County, banks of the Ogeechee River near Meldrim, *T. G. Harbison*, April 12 and May 27, 1916; Lowndes County, near Valdosta, *M. A. Huger*, March, 1914.

SOUTH CAROLINA: Hampton County, swamps on the Combahee River, near Yemassee, *T. G. Harbison*, March 15, 1916; Aiken County, near Aiken, *H. W. Ravenel*, March 18, 1880.

NORTH CAROLINA: Craven County, near New Bern, *T. G. Harbison*, April 20, 1919.

Crataegus aestivalis var. maloides, n. var. — *Crataegus maloides* Sargent, Trees and Shrubs, I. 9, t. 5 (1902).

Differing from the type in the hairs on the upper side of the midrib of the leaves, in the shape of the leaves on the end of vigorous shoots, sometimes broad-obovate, rounded and often 3-lobed at apex, in the longer acuminate calyx-lobes villose on the inner surface, and in the dark rose-colored anthers.

FLORIDA: wet prairies, near Seville, Volusia County, *A. H. Curtiss*, March, June and July, 1900 (No. 6679.)

Crataegus aestivalis var. cerasoides, n. var. — *Crataegus cerasoides* Sargent, Trees and Shrubs, II. 237 (1913).

Differing from the type in the short white hairs on the upper surface of the young leaves, the longer acuminate calyx-lobes slightly villose on the inner surface, and often minutely serrate near the middle, the dark rose-colored anthers and in the larger fruit on drooping pedicels, ripening in July and August.

A shrub with numerous stems often 10 m. high, forming a round-topped head 10–12 m. in diameter.

FLORIDA: Volusia County, low wet often inundated prairies; Leon County, Bradfordville; Hamilton County, Jasper; Gadsden County, Quincy.

Crataegus aestivalis var. **cerasoides** f. **luculenta,** n. forma. — *Crataegus luculenta* Sargent, Trees and Shrubs, I. 11, t. 6 (1902).

Differing from the var. *cerasoides* in the more broadly obovate leaves, in the more numerous hairs on their upper surface while young, the rather smaller flowers, the smaller and less juicy fruit, ripening at the end of June or early in July, and in its often arborescent habit.

FLORIDA: Volusia County, "Haw Creek."

Crataegus rufula, nov. nom. — *Crataegus aestivalis* Torrey & Gray, N. Am. Fl. I. 468, in part (1840), not *Mespilus aestivalis* Walter.

Leaves oblong-obovate, acute or rounded at apex, gradually narrowed, cuneate and entire at base, finely crenately glandular-serrate, and often slightly lobed with short rounded lobes above the middle; covered above with soft pale hairs and whitish tomentose below when they unfold, and at maturity thick, dark green, lustrous and glabrous or slightly pubescent along the midrib on the upper surface, rufous pubescent especially on the midrib and veins on the lower surface, 2–3.7 cm. long and 1.8–3 cm. wide, rarely not more than 2.5 cm. long and 1.2 cm. wide; petioles slender, villose-pubescent with rufous hairs, occasionally glandular, 6–8 mm. in length; leaves at the ends of vigorous shoots oblong-obovate, rounded and short-pointed to elliptic and acuminate, laterally lobed or deeply 3-lobed at apex and often 6 cm. long and 3.8 cm. wide. Flowers appearing from the 10th to the end of March, 1.8–2.5 cm. in diameter, in mostly 3–5-flowered clusters, on villose pubescent pedicels about 8 mm. in length; calyx-tube broadly obconic, glabrous or villose-pubescent sometimes in the same cluster, the lobes gradually narrowed from a wide base, acuminate, entire or slightly glandular-serrate nearly to apex, glabrous or slightly pubescent on the outer surface; stamens 20; anthers dark rose color; styles 3–5, surrounded at base by a ring of white tomentum. Fruit ripening the end of May, often solitary on glabrous erect pedicels 6–12 mm. long, subglobose, scarlet, lustrous, about 1.2 cm. in diameter, with yellow juicy subacid flesh, the calyx persistent, with erect lobes; nutlets rounded and only slightly grooved on the back, about 6 mm. long.

A tree sometimes 10 m. high, with a tall trunk 20–25 cm. in diameter, covered with rough deeply furrowed dark bark, paler and less deeply furrowed on smaller and younger stems, stout, ascending and spreading branches forming a broad round-topped head, and slender slightly zigzag branchlets covered when they first appear with pale tomentum, glabrous or rusty tomentose until the early summer, becoming chestnut-brown, lustrous and glabrous before autumn, and dull gray in their second year, and unarmed or armed with slender or stout straight spines 1.2–3.8 cm. in length.

NORTH CAROLINA. Wayne County, near Goldsboro, *T. G. Harbison*, April 10 and May 25, 1919.

GEORGIA. Dougherty County, near Albany, *T. G. Harbison*, April 16, 1917; Decatur County, Douglas Pond, near Bainbridge, *G. R. Shaw*, March 15, 1907, *T. G. Harbison*, May 29, 1909, May 8, 1919.

FLORIDA. Jackson County, Cottondale, *T. G. Harbison*, March 9, May 28, 1916, March 18, 19, 20, 1917, Round Lake, *T. G. Harbison*, March 8, 9, 18, May 25, 27, 1917; Gadsden County, Quincy, *R. M. Harper*, March 15, 1910, *T. G. Harbison*, March 10, 1916.

ALABAMA. Houston County, near Dothan, *T. G. Harbison*, March 17, May 23, 1917.

SILVICOLAE

Crataegus drymopila, nov. nom. — *Crataegus silvicola* Beadle in Bot. Gaz., XVIII. 414 (1899), not Gandoger.

In 1871 Gandoger published with a complete technical description in the Bull. Soc. Bot. France, XVIII. 448, a *Crataegus silvicola*, a native of France, and this name is not therefore available for the species from our southern states.

MOLLES

Crataegus meridionalis, n. sp.

Leaves elliptic to ovate or slightly obovate, acuminate, cuneate at the entire base, and coarsely often doubly serrate above with broad straight glandular teeth, coated below with hoary tomentum and covered above with short white hairs when they unfold, more than half grown when the flowers open from the first to the middle of April, and at maturity thin, yellow-green and scabrate on the upper surface, paler and villose-pubescent on the lower surface, especially on the slender midrib and primary veins, 7–8 cm. long, and 4–5 cm. wide; petioles slender, slightly wing-margined at apex, densely villose-pubescent with white hairs early in the season, becoming glabrous or nearly glabrous, 1.5–2 cm. in length; leaves on the end of vigorous shoots broad-ovate to broad-elliptic, more coarsely serrate, occasionally slightly divided into short broad lateral lobes, often 8–9 cm. long and 6–7 cm. wide, with a stout midrib, and petioles broadly wing-margined at apex and 1–1.5 cm. in length. Flowers 1.5–2 cm. in diameter, on stout pedicels thickly covered like the narrow obconic calyx-tube with matted silvery white hairs, in broad compact many-flowered villose corymbs, with conspicuous glandular-serrate villose bracts and bractlets mostly persistent until after the flowers open; calyx-lobes narrow, acuminate, laciniately glandular-serrate, slightly villose-pubescent when the buds open; stamens 20; anthers white; styles 3–5, surrounded at base by a broad ring of white tomentum. Fruit ripening from the middle to the end of September, on elongated slender puberulous pedicels, in few-fruited drooping red-stemmed clusters, short-oblong to subglobose, rounded at the ends, scarlet, 1–1.2 cm. in diameter, the calyx persistent, much enlarged, with erect or spreading conspicuous lobes; flesh thin, dry and mealy; nutlets 3–5, rounded at base, acute at apex, ridged on the back with a high rounded ridge, 7–8 cm. long, A tree often 7–8 m. high, with a trunk 15–20 cm. in diameter, covered with dark bark slightly divided by shallow fissures into broad thin plates, spreading ashy gray branches forming a round-topped head, and slender zigzag branchlets, covered when they first appear with long white hairs, soon glabrous, orange-brown or reddish brown during their first season and dull gray the following year, and armed with numerous straight slender purple spines 2–6 cm. in length.

ALABAMA: Hale County, near Gallion, *T. G. Harbison*, April 17 and September 21, 1915 (type).

MISSISSIPPI: Oktibbeha County, Starkville, *T. G. Harbison*, April 7, 1913; Noxubee County, Brookville, *T. G. Harbison*, May 3, 1915.

Crataegus noelensis, n. sp.

Leaves ovate to oval, acute, acuminate or rarely rounded at apex, acutely or broadly cuneate at base, and coarsely doubly serrate with straight teeth, covered above with short white hairs and densely villose-pubescent below when they unfold, more than half grown when the flowers open at the end of April, and at maturity dark yellow-green, smooth and glabrous on the upper surface, villose-pubescent on the lower surface, 5–8 cm. long, and 3–6 cm. wide, with a prominent midrib and thin conspicuous primary veins; petioles slender, slightly wing-margined at apex, hoary tomentose early in the season, becoming glabrous, 1–3 cm. in length; leaves at the end of vigorous shoots broadly ovate, acuminate, rounded or cuneate at the broad base, more coarsely serrate, usually laterally lobed with short broad acuminate lobes, and often 9 cm. long and 7–8 cm. wide. Flowers 2 cm. to nearly 2.5 cm. in diameter, on short pedicels densely covered like the narrow obconic calyx-tube and the compact 5–10-flowered corymb with long matted white hairs; calyx-lobes slender, long-acuminate, minutely glandular-serrate, slightly villose; stamens 5–10, usually 10; anthers rose color; styles 3–5, surrounded at base by a broad ring of pale tomentum. Fruit ripening in September, on slender drooping pubescent pedicels, subglobose, orange-red, about 1 cm. in diameter, the calyx prominent with a short tube and spreading closely appressed lobes; flesh thin, soft and yellow; nutlets 3–5, rounded at base, narrowed and rounded at apex, slightly grooved on the back, 5–6 cm. long.

A tree 6–7 m. high, with a trunk sometimes 15 cm. in diameter, spreading branches forming a broad flat or round-topped head, and stout zigzag branchlets coated when they first appear with matted white hairs, reddish brown, pubescent or puberulous during their first season and gray the following year, and armed with few or many slender straight purple lustrous spines 2–7 cm. in length, sometimes persistent and compound on old trunks.

MISSOURI: McDonald County, near Noel, *B. F. Bush*, August 8, October 12, 1908 (No. 6), April 24, 1909 (Nos. 5488, 5509), April 21, 22, 1915 (Nos. 7474, 7485, 7486, 7487), May 10, 1915 (No. 7528); *E. J. Palmer*, September 3, 1913 (No. 4097, type), April 30, 1914 (No. 5433).

COCCINEAE

Crataegus Holmesiana var. **tardipes,** n. var. — *Crataegus tardipes* Sargent in Ontario Nat. Sci. Bull. No. 4, 51 (1908).

The late ripening fruit first called my attention to this tree and led me to describe it as a species. This character, however, has little morphological value. It differs, too, from *C. Holmesiana* Ashe in its darker green leaves rougher on the upper surface, larger flowers on often villose pedicels, and in the shorter pedicels of the more constantly obovoid fruit. In size, habit, and in the bark of the trunk and branchlets this tree does not differ from *C. Holmesiana* with which it grows in Ontario, the Province of Quebec and in central and western New York, and can best perhaps be considered a variety of that species.

Crataegus pedicellata var. **gloriosa,** n. var. — *Crataegus gloriosa* Sargent in Rep. N.Y. State Mus. 122, 79 (1908).

The rather larger flowers with pink, not deep rose-colored anthers, the somewhat larger more lustrous fruit usually mamillate at base, and ripening a few days earlier, the convex leaves and the somewhat paler bark of the trunk, led me at one time to consider this tree specifically distinct from *C. pedicellata* Sargent. Having seen more of the trees growing near Rochester, New York, which is the only place where *C. gloriosa* has been found, I now believe that it is best considered a variety of *C. pedicellata* which is common in the same region.

NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM [1]

Alfred Rehder

SAXIFRAGACEAE (*continued*)

Ribes L.

Ribes vulgare Lam. f. **variegatum,** comb. nov. — *Ribes rubrum 3. variegatum* Weston, Bot. Univ. I. 244 (1770). — *Ribes rubrum var.* Schmidt, Oester. Baumz. II. 44, t. 93 (leaf) (1794). — *R. rubrum* 6, *foliis luteo-variegatis* Du Hamel apud Loudon, Arb. Brit. II. 977 (1838). — *R. rubrum* 3, *foliis aureo-marginatis* Hort. apud Kirchner in Petzold & Kirchner, Arb. Musc. 414 (1864). — *R. rubrum aureo-marginatum* hort. apud Schelle in Beissner, Schelle & Zabel, Handb. Laubholz-Ben. 143 (1903).

Of the common currant Miller in his Catalogus plantarum, pp. 64, 65 (1730) enumerates 3 different variegated forms: 1. Ribes; vulgaris, foliis ex luteo variegatis — 2. Ribes; vulgaris, foliis ex albo variegatis. — 3. Ribes; fructu albo, foliis ex albo variegatis. The leaf figured by Schmidt is

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[1] Continued from p. 210.